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10/583,908	06/21/2006	Christophe Martinez	292618US2PCT	4808
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER LAM, HUNG Q	
			ART UNIT 2883	PAPER NUMBER
			NOTIFICATION DATE 06/07/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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## Office Action Summary

Application No.

10/583,908

Applicant(s)

MARTINEZ ET AL.

Examiner

Hung Lam

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 39-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-43, 47-49, 54-56, 59-62, 65, 67, 69, 70, and 76 is/are rejected.
- 7) ☒ Claim(s) 44-46, 50-53, 57, 58, 63, 64, 66, 68 and 71-75 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/11/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Status of the Application***

Claims 39-76 are pending in this application.

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on October 11, 2006 was filled in compliance with the provisions of 37 CFR 1.97. The examiner has considered the information disclosure statement.

If applicant is aware of any prior art or any other co-pending application not already of record, he/she is reminded of his/her duty under 37 CFR 1.56 to disclose the same.

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in Application No. 10/583,908, filed on June 21, 2006.

### ***Drawings***

The drawings submitted on June 21, 2006 are accepted as part of the formal application.

### ***Specification***

The specification is accepted as part of the formal application.

Applicant cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 62 and 76 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. For instance, line 2 of both claims 62 and 76 with the phrase "and/or" is considered to be vague and indefinite because it fails to give understanding to whether elements of the claim are to be considered in alternate or in combination.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

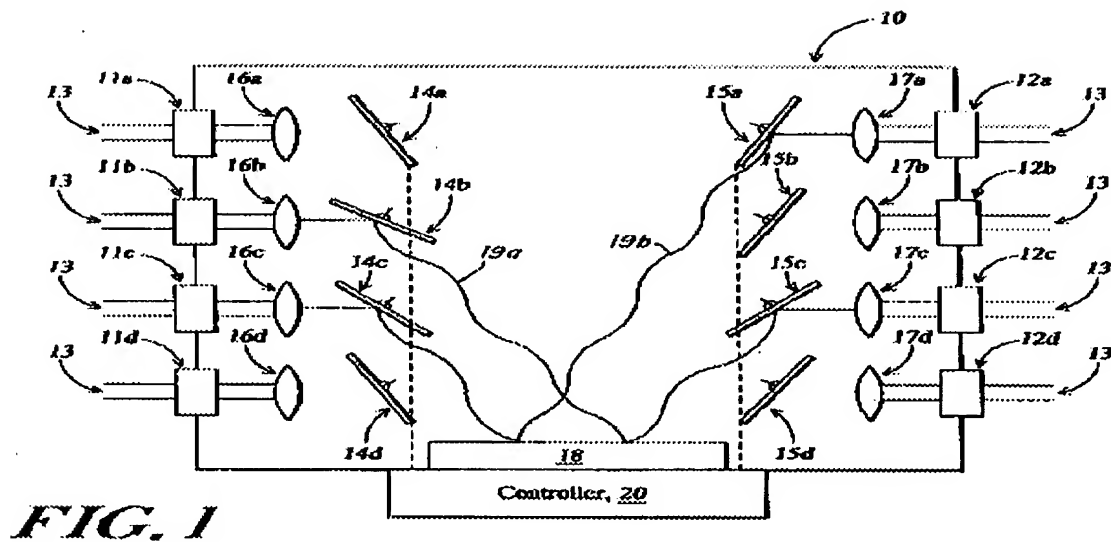
The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 39-43, 47-49, 54-56, 59-61, 65, 67, and 69-70, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen (US. Pat. 6,735,357), and Chang (US. Pat. 6,776,492) further in the view of Chen et al. (US. Pub. 2003/0133204).**

**Regarding claims 39-43, Jensen discloses a feedback control system for all optical cross connect having at least two deflection modules comprising:**

- An coming light beam into input port 11b having a given direction of propagation an outgoing light beam at output port 12b having a direction of propagation taken in a first set of potential direction 19a (col. 4 lines 15-28, and Fig. 1).
- Each optical deflection module comprises a same single deflection element 18 of the incoming light beam having two return elements or the mirrors 14a and 15b on the either side of the defection element 18, a principal direction being collinear with the given direction of propagation of the incoming light beam from port 11 or of the outgoing light beam from port 12, the principal direction of the optical deflection modules being located in a same plane (col. 3 lines 58-64, col. 5 lines 8-12, and Fig. 1).

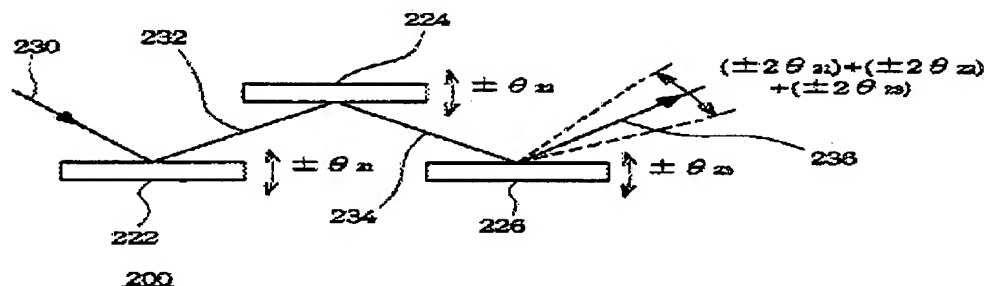


**FIG. 1**

Reproduced from US. Pat. 6,735,357.

However, **Jensen** fails to disclose that the two reflected return elements 14b and 15b, are two fixed return elements; and the single deflection element is configured to assume plurality potential position that are in relation to the potential directions.

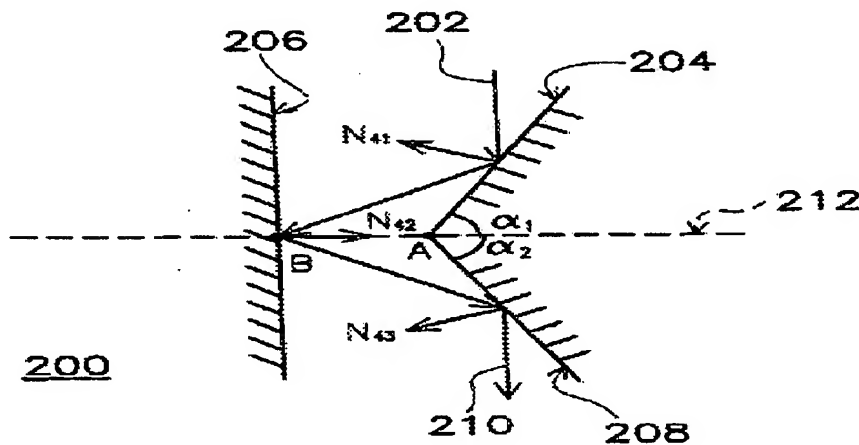
**Chang** teaches a multiple reflective mirrors module comprising a deflection element 224 with two return element 230 and 226 on either side, is configured to assume plurality potential position that are in relation to the main/principle direction 236 in the potential directions (col. 4 lines 35-45, and Fig. 2).



**Fig. 2**

Reproduced from US. Pat. 6,776,492.

**Chen et al.** teach a derotation mirror system having two fixed surface-reflecting mirrors 204 and 208 with predetermined angle for potential propagation direction on the either side of the surface-reflecting mirror 206 ([0039], and Fig. 4).



**FIG. 4**

Reproduced from US. Pub. 2003/0133204.

It would have been obvious to the one having ordinary skill in the art at the time the invention was made to use the teachings of **Chen et al.** and **Chang** to modify the optical system of **Jensen** with the deflection element 224 of Chang and the two fixed return elements 204 and 208 of Chen et al. The motivation for doing so is because **Chang's** deflection element and return elements "...provide the multiple reflective mirrors module according to the present invention with a more extended working angle" plus **Chen et al.'s** surface-reflecting mirrors 204 and 208 are fixed to the system with a predetermined angle  $\alpha_1$ ,  $\alpha_2$  that relating to the surface-reflecting 206 and the virtual reference surface 212, therefore "...so that both the input image 202 and the output image 210 are on the same axis..." or "...the derotation system manages to constrain the propagation of the output image vector and the output image vector along the same Z-axis line."

(Chang col. 4 lines 55-56, and Chen et al. "abstract", [0039]). Such a combination is still able to provide multiple reflection positions as Jensen teaches while reduce the number of moving reflecting elements, thus simplifies manufacture and alignment processes.

**Regarding claims 40-43**, in accordance with the rejection of claim 39, **Jensen** modified by **Chang** and **Chen et al.** further discloses that the given direction is a fixed direction; the set of potential directions comprises discrete predetermined directions; the deflection element of at least one module includes a mirror; and at least on potential position of the deflection element of at least one module is a mechanically predetermined discrete position.

**Regarding claims 47-49**, in accordance with the rejection of claim 39, **Jensen** modified by **Chang** and **Chen et al.** further discloses that the main potential position of the deflection element is at a position in which the deflection element is at rest (Chang Fig. 2, and Chen et al. Fig. 4); the deflection element of a module is configured to move in rotation about an axis perpendicular to at least one of the potential directions and the rotation is contained in the plane formed by the given direction and the main potential direction (Chang Fig. 2);

**Regarding claims 54-56, 59-61, and 65**, in accordance with the rejection of claim 39, **Jensen** modified by **Chang** and **Chen et al.** further discloses that the deflection element is a micro-mirror (MEMS) therefore it is fabricated by techniques used in microelectronics and has at least one pair of electrodes to control the angle's tilting (Chang col. 1 lines 57-67 and col. 3 line 38); the optical deflection matrix further comprising conduits (fibers) for guiding the incoming and outgoing light beams (Jensen, numeral 13 in Fig. 1); the two return elements of a module are symmetrical relative to a plane perpendicular to the main direction of potential propagation



(Chang Fig. 2); the modules are placed in the same plane and the deflection plane of the deflection elements in their main position being parallel (Jensen's Fig.1 after modified by Chang); plurality optical deflection modules in a column where the light beam having each a fixed direction of propagation and the direction of propagation are in parallel (Jensen Fig. 1).

**Regarding claims 67, 69-70**, in accordance with the rejection of claims 39 and 67, **Jensen** modified by **Chang** and **Chen et al.** further discloses that the return elements and the deflection elements of the modules are grouped on the same substrate (Jensen Fig. 1); the deflection element is placed opposite to the return elements (Chang Fig. 2).

*Allowable Subject Matter*

Claims 44-46, 50-53, 57-58, 63-64, 66, 68, 71-75, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following paragraphs are the limitation of allowable subject matter claims, which are distinguished over the prior arts of records.

With reference to the limitation in claims 44-46, which claims "...an abutment defines at least one mechanically predetermined position of the deflection element of a module by stopping the deflection element" where the prior art of records do not have the "abutment" structure in its deflection element (MEMS).

With reference to the limitation in claims 50-53, which claim the following "...the deflection element ...comprises at least two reflective faces...and configured to move in translation..." "...Link arm..." "...the deflection element of at least one module is on a mobile

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base”, and “...the mobile base integral with the link arm...” where the prior art’s deflection element (MEMS) that do not have such a structure as claimed in claims 50-53.

With reference to the limitation in claims 57-58, the prior art of records do not show that the optical deflection matrix is made by “...molding techniques” or “...transfer techniques”.

With reference to the limitation in claims 63-64, 66, 68 and 71, the prior art of records do not disclose an “optical conjugation element” in the module’s substrate on the same line between two separated successive optical deflection element and having collinear optical axes.

With reference to the limitation in claims 72-75, the prior art of records do not disclose a “link module” between two input and output matrices.

It is the examiner opinion that prior art taken alone or in combination does not disclose or render obvious to the claimed limitations discussed above.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Lam whose telephone number is 571-272-9790. The examiner can normally be reached on M - F 07:30 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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